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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/509,909

04/07/2005

Uwe Keyser

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EXAMINER

MONDT, JOHANNES P

ART UNIT

PAPER NUMBER

3663

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

04/17/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/509,909

Applicant(s)

KEYSER ET AL.

Examiner

Johannes P. Mondt

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 January 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) 6-13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

Applicant's election with traverse of the Group I invention of in the reply filed on 1/24/07 is acknowledged. The traversal is on the ground that for the international application of which the current application is the national stage no lack of unity was issued. This argument is not found persuasive because an entirely different office was responsible for the decision whether enough time was available to examine the entire claim set. No other grounds in traverse of the Restriction Requirement were raised. Accordingly, the requirement is still deemed proper and is therefore made FINAL.

Information Disclosure Statement

The examiner has considered all items listed in the Information Disclosure Statement filed 10/04/2004, except the item listed with inventor name Grenier et al for lack of a matching between the Patent Number and the inventor / date information. Instead, examiner has considered US Patent to Grenier et al with Patent Number 5,373,538, and has indicated such in the signed Form PTO-1449 enclosed with this office action. For this reason Grenier et al is also included in Form PTO-892.

Claim Objections

The claims are objected to because they include reference characters which are not enclosed within parentheses.

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Reference characters corresponding to elements recited in the detailed description of the drawings and used in conjunction with the recitation of the same element or group of elements in the claims should be enclosed within parentheses so as to avoid confusion with other numbers or characters which may appear in the claims. See MPEP § 608.01(m).

Specifically, the reference character 'n' (line 2 of claim 1) should be removed.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. **Claims 1-5** through claim 1 recite the limitation "at least as far as the region of 12 MeV," in line 9. There is insufficient antecedent basis for this limitation in the claim. Furthermore, a single energy value cannot possibly define a region in the domain of energy values. Although 12 MeV is clearly a point in the region the meets and bounds of the claim are indefinite because the boundaries of the region of 12 MeV are not defined at all.
2. **Claims 1-5** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, the limitations "elements and/or isotopes" (claim 1, line 12), "the elements and/or isotopes" (claim 2, line 4), "per element and/or isotope" (claim 2, line 5) render indefinite whether the

meets and bounds of the claimed subject matter in this regard is defined by "elements and isotopes" or merely by "elements or isotopes".

3. **Claim 2** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, the limitation "the complete measurable range" is multiply indefinite, being (a) without antecedent basis, and (b) being otherwise definite only in the presence of a clear definition of said range in terms of a photon energy range and an explanation as to why photon energies outside said photon energy range cannot be measured. It is to be kept in mind that "measurable" hinges upon the capability of measurement methods and instrumentation not delineated in the Specification.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 1-5** are rejected under 35 U.S.C. 103(a) as being unpatentable over Grenier et al (5,373,538) (see IDS and the above comments under Information Disclosure Statement) in view of Salisbury (4,397,810).

Grenier et al teach a method for the non-destructive chemical analysis of test objects by means 4 of irradiating the test object with neutrons (neutron irradiation means 4; see

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abstract and col. 8, l. 41-46) and measuring the amount of gamma photon radiation emitted (by means of high resolution gamma detectors **14**; see col. 8, l. 59-63) promptly by the test object during the irradiation from the number of gamma photon quanta and respective photon energy in order to record a photon energy spectrum, characterized by

- determining characteristic photon energies from the amounts of gamma photon radiation from the entire photon energy spectrum which exceed background photon radiation, at least as far as a region of about 12 MeV is concerned (col. 1, l. 33-43), and
- determining the elements and/or isotopes of the test object by assigning the characteristic photon energies distributed over the entire photon energy spectrum to corresponding elements and/or isotopes which are in each case stored unambiguously in relation to a photon energy (by processing means including electronic processing means **18/20/22/24** and computer **26**; see col. 9, l. 13 – col. 10, l. 7).

Grenier et al do not necessarily teach the limitation that said neutrons are generated from target-free fusion of concentrically accelerated deuterium ions, although Grenier et al do teach a 14 MeV neutron source (col. 8, l. 41-45), while 14 MeV happens to be the neutron energy produced by a D-D fusion reaction.

However, it would have been obvious to include said limitation in view of Salisbury, who, in a patent on a particle beam based nuclear fusion reaction source (see abstract, first sentence), hence analogous art, teaches a neutron source in the form of a cyclotron (see abstract and col. 12, l. 15-33; and Figure 1), hence

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concentrically accelerated ions in the form of counter-rotating ion beams (abstract) producing collisions of ions in one beam with those in another resulting in fusion reactions producing neutrons in a target-free manner (here interpreted to mean: not involving any target other than beam constituents). The ions are concentrically accelerated because the orbits are defined by radii (col. 3, l. 55 col. 2, l. 56, especially col. 3, l. 55-66).

Motivation to include the teaching by Salisbury into the invention by Grenier et al derives from the possibility to focus on exactly the reaction indicated by Grenier et al through the use of deuterium ions as the single ions in both counter-rotating beams, thus simplifying the material requirements on the inventive method.

On claim 2: the method by Grenier et al is further characterized by a quantitative determination of the chemical element composition of the test object by means of measuring the photon energy spectrum and determining the properties of the elements or isotopes determined by relating the amount of gamma photon radiation per element or isotope to the entire amount of photon radiation determined for all characteristic photon energies determined (col. 1, l. 56 – col. 2, l. 66; col. 9, l. 61- col. 10, l. 22 and col. 11, l. 54- col. 12, l. 34).

On claim 3: the amount of gamma radiation is, in the method by Grenier et al, obtained from the gamma radiation as measured (loc.cit.), which inherently determines the integrated accumulations, i.e., the areas of the characteristic curves in the regions of the characteristic photon energies, because any instrument counts an event not based

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on absolute certainty of wavelength but based on being in a bin defined by lower and upper limit.

On claim 4: the method is further characterized by recording a base photon energy spectrum of the test chamber without the test object and calculating a photon energy spectrum used for evaluation as claimed, as what is commonly known and trivially included in any serious measuring technique (to which examiner takes official notice) as a benchmark or null experiment (see col. 12, l. 3-11).

On claim 5: the method by Grenier et al is further characterized by comprising irradiating sections of the test object from a plurality of directions and evaluating the plurality of measurement results (col. 8, l. 47 – col. 9, l. 2: because measurements are taken during an extended period of time during which the test item travels on a conveyor belt).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Miley et al (WO 99/24990) (see IDS).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Johannes P. Mondt whose telephone number is 571-272-1919. The examiner can normally be reached on 8:00 - 18:00.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack W. Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JPM
April 14, 2007

Primary Patent Examiner:


Johannes Mondt (TC3600, AU3663).